

## **APPENDIX E**

### **PREPARATION OF EQUIPMENT AND SUPPLIES AND JOINT INSPECTION PROCEDURES**

#### **A. Air Transported Vehicles**

1. Vehicles and equipment should be prepared so as not to diminish their combat capability. They should be reduced only enough to meet the dimensional and weight restrictions of the aircraft that will transport them. Extensive use of masking tape and wood on windows is discouraged.

2. For dimensional load factors refer to Appendix D.

#### **B. Fuel In Air Transported Equipment**

1. Fuel level requirements must conform with Air Force Joint Manual (AFJMAN) 24-204, Defense Logistics Agency Instruction (DLAI) 4145.3, Marine Corps Order (MCO) P4030.19G, Naval Supply (NAVSUP) Publication (Pub) 505, Technical Manual (TM) 38-250, Preparing Hazardous Material for Military Air Shipments.

2. Tankers and refuelers containing fuel are not authorized for air movement. They will be emptied, labeled, and purged according to technical directives. (Some do not require purging.)

3. Collapsible, 500-gallon fuel containers may be filled with fuel for air movement. Containers must be labeled and/or purged per AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.

C. Water Tanks. Water tanks and water trailers will be empty with the following exception. When water is not available at destination, the M149A2 water trailer may be used in compliance with established procedures. Water may also be transported in certified air transportable containers such as 5-gallon water cans, 55-gallon drums, 250-gallon rubber water bladders, and 500-gallon fabric, collapsible drums. Consult mobility force personnel for current guidance.

#### **D. General Cargo**

1. General cargo may be carried in or on any type of vehicle if the cargo can be properly secured and restrained.

2. Supplies and equipment not loaded into vehicle cargo compartments should be secured on 40- by 48-inch pallets or packed in container inserts or other suitable containers. Do not exceed 1,000 pounds (lbs) per insert or 2,000 lbs per pallet. Pallets and inserts will be identified in the unit's load plans.

E. Containers. Internal airlift and helicopter slingable unit (ISU) containers are certified for movement. They are 463L compatible and have a 10,000-lb capacity. The base measures 88 inches by 108 inches and allows forklift entry. ISUs are available in heights of 60 inches and 90

inches. Serviceable containers and International Organization for Standardization shipping containers are also air transportable when palletized. Keys to containers must be available during all phases of marshalling, inspection, and loading. Hazardous materials (HAZMAT) must be accessible at all times when carried within containers. Keys, or other methods of opening containers containing HAZMAT, must accompany these containers during transportation.

F. HAZMAT. AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3 provides instructions for preparation, packaging, and handling of HAZMAT for shipment aboard military aircraft. These instructions are intended to ensure such materials are properly prepared for airlift. (See Appendix C.)

G. Helicopters/Aircraft. Information and guidance concerning loading procedures and instructions for preparing helicopters and aircraft for transport can be found in the Service technical manuals and AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.

#### H. Palletized Cargo

1. Follow pallet build-up checklist at Figure E-1. See related Service publications for additional guidance.

2. Prepare two copies of the pallet placard, DD Form 2775, Pallet Identifier (Figure E-3), to identify all completed 463L pallets/trains loaded with cargo/mail. Entries will be completed and the placards placed inside interlocking plastic bags. The Form may be computer generated. **DO NOT STAPLE DIRECTLY TO CARGO NETS.** Placards will be attached to upper left-hand corner at eye level on the 88-inch and 108-inch sides of a loaded pallet. Additional information required by the Services may be entered in the miscellaneous block of the form.

## I. Pallet Build-Up Procedures Checklist

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|---|
| <ul style="list-style-type: none"><li>a. Are you prepared to follow good safety practices?<ul style="list-style-type: none"><li>(1) Do personnel have steel toed safety shoes and work gloves?</li><li>(2) Have personnel been briefed on proper lifting techniques?</li></ul></li><li>b. Is the pallet skin free of damage, top and bottom, and any bent lips on the pallet perimeter?</li><li>c. Are tie down rings serviceable?</li><li>d. Is the pallet level and not warped?</li><li>e. Is the pallet free of corrosion?</li><li>f. Is the pallet clean and free of dirt?</li><li>g. Is the pallet right-side up?</li><li>h. Is the pallet placed on three-point dunnage?</li><li>i. Is cargo to be placed on the pallet securely packaged?</li><li>j. Does cargo have required markings?</li><li>k. Are HAZMAT labels prepared in accordance with 49 Code of Federal Regulations 172.400, <u>General Labeling Requirements</u> and AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3?</li><li>l. Are HAZMAT labels attached to items of hazardous cargo or their containers?</li><li>m. Is cargo marked with arrows, e.g., “This Side Up,” placed with arrows pointing up?</li><li>n. Are hazardous items on pallet compatible in accordance with AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.</li><li>o. Is all hazardous cargo positioned for easy access during flight? Are hazardous cargo labels visible from an 88-inch side of the pallet? Do the doors of mobility bins containing hazardous items open to an 88-inch side of the pallet? NOTE: Consult appropriate aircraft Dash 9 for requirements. Pallets on the C-17, when utilizing the Logistics Rail System, are loaded 88 inch side first, (long ways), which can effect access to HAZMAT during flight. In all cases, hazardous cargo must be accessible by aircrew personnel before and during flight.</li><li>p. Is cargo arranged on the pallet to meet the following criteria:<ul style="list-style-type: none"><li>(1) Are the heavier boxes and crates placed on the bottom of the pallet load?</li><li>(2) Is lighter, more fragile cargo placed on the top of the pallet load?</li><li>(3) Is the cargo arranged and properly stacked so that it is stable?</li></ul></li><li>q. Is the height of the built-up pallet 96-inches or less from the top skin of the pallet? If it is not and the height cannot be reduced to under 96-inches, consult your affiliated AMCS for guidance to determine if the pallet will fit inside the aircraft. Is the cargo loaded so it is no more than 104-inches wide with no overhang over either of the 108-inch sides? Consult C-17 Dash 9 for unique characteristics when utilizing the Logistics Rail System. Front and rear overhang over the 88 inch side of the pallet is acceptable if it cannot be avoided because of a single large item. Ensure sufficient space is allotted for cargo to be loaded in front of and behind pallets with overhang. Consult C-17 Dash 9 for unique characteristics when utilizing the Logistics Rail System</li><li>r. Is the pallet loaded with no more than 10,000 lbs of cargo?</li><li>s. Is pallet loading limited to less than 250 lbs per square inch on the pallet’s surface? Normally, this is a problem only with very heavy cargo with a small “footprint,” such as full oil drums with a rim, heavy skid-mounted cargo, or maintenance stands, with heavy cargo stacked on top of them.</li><li>t. Is cargo susceptible to weather damage? If so, cover the cargo with a plastic pallet cover before installing cargo nets.</li></ul> |
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**Figure E-1. Checklist for Pallet Build-Up**

- u. Is cargo secured to the pallet using two side nets and a top net? When low profile cargo does not permit the use of side nets, the top net may be used for restraint in all directions (vertical, lateral, forward, and aft), provided the net weight of the pallet does not exceed 2,500 lbs and cargo height does not exceed 45 inches from the surface of the pallet. Exceeding weight or height limitations requires supplemental restraint (straps or chains) be applied to provide the required restraint.
- v. Does the top net have five serviceable clips? Does each side net have five serviceable hooks along each side of its length, four along each side of its width, and one at each corner? Are nets free of tears, rips, and broken rings?
- w. Lay the side nets out so that the length and width are aligned with the length and width of the pallet. Make sure the adjusting straps are on the outside of the net after installation. Beginning at any corner and proceeding to the corner diagonally opposite, attach the clips to the D-rings around the edge of the pallet and continue with the other side of the net making sure the straps are not twisted. Go back and criss-cross the two slips at each corner. Fasten the side nets together by starting at the bottom and attaching the hook at the edge of one net to the ring at the edge of the other. Make sure the straps are not twisted and the hooks open outward so the strap length can be adjusted. Pull the nets up as high as possible. Temporarily tightening the side straps is permissible, however, remember to loosen them later when tightening the top net.
- x. Spread the top net on the ground top-side down, and align its length with that of the pallet. After verifying no one is standing on the far side of the pallet, throw the net over the pallet, flipping it over so it lands top-side up. Adjust the net so it is centered on the pallet. Fasten the top net hooks to the highest side net rings possible and still be able to remove all slack out of the side nets when the top net is cinched down. Make sure the straps are not twisted, then tighten the top net by shortening the straps (pulling down), alternating from end-to-end. Now go back and retighten the side net straps. Tuck all strap ends into the netting to prevent tangling in the aircraft rail or roller system.
- y. Attach a placard with pallet gross weight, identification, etc., to the netting on the 88-inch and 108-inch sides of the pallet.
- z. Dunnage (3 pieces) MUST accompany each pallet during deployment.
- aa. Keys or combinations to any locked containers must accompany the item and be made available to the troop commander or cargo courier/custodian during transport in the event of an in-flight emergency.

**Figure E-1. Checklist for Pallet Build-Up (Cont'd)**

J. Inspection Standards. DD Form 2133, Joint Airlift Inspection Record (Figure E-2), should be used as a guide when preparing equipment and cargo for airlift. The following standards will be applied when preparing and inspecting cargo for airlift.

Item 1 UNIT BEING AIRLIFTED. Enter the numerical designation and geographic location of the military unit responsible for the equipment being airlifted; e.g., 1st Fighter Wing, Langley AFB VA.

Item 2 DEPARTURE AIRFIELD. Enter the name of the facility the airlifted unit is departing; e.g., Langley AFB VA.

Item 3 DATE. Enter year, month, and day that the inspection is accomplished.

Item 4 AIRCRAFT TYPE AND MISSION NUMBER. Enter the type and mission number of the aircraft on which the equipment is to be loaded.

Item 5 LOAD/CHALK NUMBER. Enter the transported force assigned aircraft load number that establishes the desired load movement sequence.

Item 6 START TIME. Enter the local time the inspection actually started.

Item 7 COMPLETE TIME. Enter the local time load was checked and is ready for movement.

Item 8 TALCE/CDF. Enter the numerical designation of the unit having Tanker Airlift Control Element/Cargo Deployment Function or aerial port responsible for the operating location.

#### K. Documentation.

Item 9 MANIFESTS/LOAD PLANS. Ensure completion of the required number of copies. Check for proper manifesting of the entire chalk and the load plan scale weights match the manifest weights. Ensure the load is correctly sequenced in accordance with (IAW) the load plan and complies with all aircraft loading and safety of flight limitations.

Item 10 SHIPPER'S DECLARATION. Check for the proper preparation of all required hazardous material documentation and certification IAW AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.

Item 11 HAZARDOUS MATERIALS PREPARATION. Check that all HAZMAT in the load are properly prepared, positioned, and compatible with other HAZMAT in this chalk, as restricted by AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.

Item 12 LOAD LISTS/CARGO TRANSFER FORMS. Ensure the proper preparation of all required load lists and/or cargo transfer documentation.

#### L. Vehicles/Non-Powered Equipment.

Item 13 CLEAN (No dirt, trash, or pests). Clean each item of all grime, oil, dirt, etc. Steam clean if necessary. Ensure all vehicle tires are free of debris (rocks, pebbles, sand, etc.) embedded in the treads.

Item 14 FLUID LEAKS. A loss of fluid at a rate which is readily detected or seen is a leak. Five drops or more per minute from a cooling system, crank case, or gear case is a leak. Fuel or brake system leaks, no matter how minor, will prevent air shipment. Do not consider a damp or discolored seal a leak unless any of the above conditions exist.

#### Item 15 MECHANICAL CONDITION.

1. Engine Runs. Unless a vehicle is shipped as retrograde cargo, it must be in good condition. Ensure self-propelled vehicles are operational.

2. Brakes Operational. Check brakes by having driver demonstrate braking capability while vehicle is moving. Check the emergency brake for operation.

#### Item 16 BATTERY.

1. Secure-No Leaks. Ensure battery is correctly installed, i.e., holding clamp secure, filler caps tightly installed, battery connectors are tight, and all cables and clamps are not in contact with any grounding point during loading or flight.

2. Post/Cables Protected. Ensure battery terminals are covered if disconnected, e.g., rubber covers or tape, to prevent damage or short circuits.

#### Item 17 FUEL TANK(S) LEVELS.

1. Three-Fourths (3/4) Tank. Vehicles and self-propelled units will not exceed three-fourths (3/4) tank of fuel when loaded on the aircraft floor and one-half (1/2) tank of fuel when loaded on the aircraft cargo ramp. Wheeled engine-powered support equipment will not exceed one-half (1/2) tank of fuel regardless of the unit's position in the aircraft. Units loaded on the aircraft cargo ramp must be positioned with fuel tank filler openings on the high side of the ramp. These fuel limits are based on operational necessity IAW AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3, Chapter 3.

2. Drained. Equipment mounted on a single axle disconnected from its prime mover and loaded with its tongue resting on the aircraft floor must be drained, but need not be purged.

NOTE: Do not exceed one-half (1/2) tank of fuel for units loaded aboard aircraft with a steep angle of ascent, i.e., KC-10, KC-135.

3. Fuel Tank Caps Installed. Ensure fuel caps are properly installed. On closed fuel system equipment, loosen caps to allow pressure equalization.

Item 18 JERRY CANS (Secure, Fuel Level, Seal). Performance Oriented Packaging-certified Jerry cans, listed in AFJMAN 24-204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3, Attachment 7, paragraph 7.3, are authorized for transporting flammable liquid fuel stocks. Ensure that all racks are designed to accommodate and secure Jerry cans to prevent movement or leakage during airlift. Provide cushioning material or fiberboard separation to prevent metal-to-metal contact for Jerry cans not secured in racks. Jerry cans must have a serviceable gasket in place on the screw cap closure. Any leakage from or dent at the seam of a Jerry can will prohibit its acceptance for air shipment. DOT 5L Jerry cans, used to transport HAZMAT, will not be palletized. When combined with the fuel shipped in the tanks of the vehicles or equipment, DOT 5L Jerry cans will not exceed a two full-tank supply. DOT 5L Jerry cans may be palletized when drained, purging not required.

NOTE: There is no minimum fuel requirement for this container. Maximum quantity is five gallons, measured to the weld bead near top of can.

Item 19 DIMENSIONS (Fits A/C Profile or Contour). Ensure equipment will negotiate the aircraft ramps and interior dimensions and will not come in contact with aircraft sidewalls or ceiling at any time. For C-141 and C-130 aircraft the height may not exceed 103 and 102 inches, respectively, or 76 inches on the cargo ramp position. Vehicles under crew rest facilities on C-141 may not exceed 80 inches in height.

Item 20 CENTER OF BALANCE (Both Sides). Indicate the center of balance (CB) to the nearest whole inch.

NOTE: The only vehicles that require a combined CB are coupled, tractor-trailer units that will remain coupled during flight.

Item 21 SCALE WEIGHT (Both Sides). Show the gross vehicle weight to the nearest whole pound on both sides of the vehicle.

Item 22 AXLE WEIGHTS (Both Sides). Mark axle weights above each axle.

Item 23 TIEDOWN POINTS (Serviceable). Ensure all clevises and tiedown points are serviceable. Include interior and exterior cargo restraint tiedowns in the inspection.

Item 24 PINTLE HOOKS/CLEVISES.

1. Serviceable. Ensure all devices required for loading or off-loading trailers and cargo are serviceable.

2. Safety Pin Attached. Ensure all required pins or cotter keys are properly installed and serviceable.

Item 25 VEHICLE EQUIPMENT SECURE (Tools, Tires, etc.). Ensure all vehicle accessory items are secure. This includes fire extinguishers, seat brackets, and any other loose equipment that may become a projectile during flight.

Item 26 TIRE PRESSURE (Maximum 100 PSI). Check to ensure that tire pressure is within the manufacturer's specifications. Tires must be sufficiently inflated to prevent wheel-rim contact with aircraft floor.

Item 27 SHORING (Rolling, Parking, Sleeper, Approach). Check that all required shoring is serviceable and immediately available. Consult aircraft loading manual for specific shoring requirements.

Item 28 ACCOMPANYING LOAD.

1. Within Vehicle Rated Capacity. Do not exceed the rated capacity of the vehicle. Normally, this information is located on the vehicle data plate or applicable manufacturer's technical publication. Do not exceed sidewall height unless cargo can be properly restrained. Equipment permanently installed in a vehicle will be transported as a vehicle load regardless of height. This provision does not include signal shelters or other easily removed equipment.

2. Secure to Vehicle. Check that all secondary cargo is properly secured to the vehicle and will meet the same restraint criteria required for the vehicle. Use a minimum of one-half (1/2)-inch diameter rope (not nylon) for cargo restraint. Consider all locally manufactured modifications as secondary cargo. Ensure rope actually touches cargo, not just hold the side racks down.

Item 29 LOX/NITROGEN CART (Vent Kit). Ensure vent kit materials are with the cargo. Technicians will be required at load time to install vent kit.

#### M. Pallets/Pallet Trains.

Item 30 CLEAN. Clean each piece of equipment and pallet of all grime, oil, dirt, etc. Steam clean if necessary. Ensure no soil is transported on or under items loaded on the pallet.

Item 31 SCALE WEIGHT. Ensure pallet scale weight is attached to one 88-inch side and one 108-inch side of the pallet.

Item 32 DIMENSIONS (Fits A/C Profile or Contour). Check that each pallet does not exceed the dimensions of the planned aircraft position. For example, pallet position number 1 on the C-141B may not exceed 76 inches in height measured from the top surface of the pallet. Refer to aircraft loading manual for specific aircraft pallet limitations.

#### Item 33 CARGO PROPERLY SECURED.

1. Netted. Check that all cargo nets are serviceable and properly installed.
2. Chained/Strapped. When nets are not used or additional restraint is required, check that chains or straps are properly installed. Be sure they provide adequate restraint.

Item 34 DUNNAGE (3 Pieces Per Pallet). Ensure proper dunnage, three pieces, 4" x 4" x 88", accompanies the pallet during shipment.

#### N. Helicopters (Flyaway).

Item 35 FUEL QUANTITY (Gallons). Fuel quantities can not exceed three-fourths (3/4) full or 150-gallons per tank, whichever is less.

Item 36 BATTERY (Disconnected/Taped). Ensure user disconnects and tapes battery terminals and secures the battery to prevent accidental leaks and short circuits.

Item 37 CENTER OF BALANCE (Both Sides). Ensure user clearly marks the CB on both sides of the item.

Item 38 SCALE WEIGHT (Both Sides). Ensure gross weight is clearly marked on both sides of the item.

Item 39 SHORING (Rolling, Parking, Approach). Check that all required shoring is serviceable and immediately available for use.

Item 40 SPECIAL LOADING EQUIPMENT (Towbars, etc.). Ensure special equipment necessary to load this cargo is available. (Tools, jacks, pintle hooks, pumps, ramps, etc.)

Item 41 REMARKS. List and explain, in detail, any discrepancies found during the inspection and actions taken to correct the problem. Pertinent information regarding the load/chalk should also be listed in this block.

Item 42 DEPLOYING FORCE REPRESENTATIVE (Signature/Rank/Unit of Assignment). To be signed by the deploying unit representative accompanying the mobility force inspector.



Item 43 MOBILITY FORCE INSPECTOR (Signature/Rank/Unit of Assignment). To be signed by inspector qualified personnel who are also current and qualified in aircraft cargo load planning.

| JOINT AIRLIFT INSPECTION RECORD<br>(See Instructions on back)                 |  |  |  |   |                       |  |  |                  |  | Page of Pages      |  |
|---|--|--|--|---|-----------------------|--|--|------------------|--|--------------------|--|
| 1. UNIT BEING AIRLIFTED   |  |  |  |   | 2. DEPARTURE AIRFIELD |  |  |                  |  | 3. DATE (YYYYMMDD) |  |
| 4. AIRCRAFT TYPE AND MISSION NUMBER   |  |  |  | 5. LOAD/CHALK NO.                       |                       | 6. START TIME  |  | 7. COMPLETE TIME |  | 8. TALCE/CDF       |  |
| LEGEND (Mark blocks after each item as follows)                               |  |  |  | INCREMENT/SERIAL BUMPER NUMBER AND TYPE |                       |  |  |                  |  |                    |  |
| ✓ = SATISFACTORY<br>x = UNSATISFACTORY<br>IF NOT APPLICABLE, LEAVE BLANK      |  |  |  |   |                       |  |  |                  |  |                    |  |
| A. DOCUMENTATION  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 9. MANIFESTS/LOAD PLANS   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 10. SHIPPERS DECLARATION  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 11. HAZARDOUS MATERIALS PREPARATION   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 12. LOAD LISTS/CARGO TRANSFER FORMS   |  |  |  |   |                       |  |  |                  |  |                    |  |
| B. VEHICLES/NON-POWERED EQUIPMENT   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 13. CLEAN   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 14. FLUID LEAKS   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 15. MECHANICAL CONDITION  |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. ENGINE RUNS  |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. BRAKES OPERATIONAL   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 16. BATTERY   |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. SECURE - NO LEAKS  |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. POST/CABLES-PROTECTED  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 17. FUEL TANK(S) LEVELS   |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. AS REQUIRED  |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. FUEL TANK CAPS INSTALLED   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 18. JERRY CANS  |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. DOT 5L (Metal)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. POP (Plastic)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 19. DIMENSIONS (Fits A/C Profile or Contour)                                  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 20. CENTER OF BALANCE (Both Sides)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 21. SCALE WEIGHT (Both Sides)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 22. AXLE WEIGHTS (Both Sides)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 23. TIEDOWN POINTS (SERVICEABLE)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 24. PINTLE HOOKS/CLEAVISES  |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. SERVICEABLE  |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. SAFETY PIN ATTACHED (Safety Chains)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 25. VEHICLE EQUIPMENT SECURE (Tools, tires, etc.)                             |  |  |  |   |                       |  |  |                  |  |                    |  |
| 26. TIRE PRESSURE   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 27. SHORING (Rolling, Parking, Sleeper, Approach)                             |  |  |  |   |                       |  |  |                  |  |                    |  |
| 28. ACCOMPANYING LOAD   |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. WITHIN VEHICLE RATED CAPACITY  |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. SECURE TO VEHICLE  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 29. LOX/NITROGEN CART (Vent Kit)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| C. PALLETS/PALLET TRAINS  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 30. CLEAN   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 31. SCALE WEIGHT  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 32. DIMENSIONS (Fits A/C Profile or Contour)                                  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 33. CARGO PROPERLY SECURED  |  |  |  |   |                       |  |  |                  |  |                    |  |
| a. NETTED   |  |  |  |   |                       |  |  |                  |  |                    |  |
| b. CHAINED/STRAPPED   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 34. DUNNAGE (3 Pieces Per Pallet)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| D. HELICOPTERS (Flyaway)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 35. FUEL QUANTITY (Gallons)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 36. BATTERY (Disconnected/Taped)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 37. CENTER OF BALANCE (Both Sides)  |  |  |  |   |                       |  |  |                  |  |                    |  |
| 38. SCALE WEIGHT (Both Sides)   |  |  |  |   |                       |  |  |                  |  |                    |  |
| 39. SHORING (Rolling, Parking, Approach)                                      |  |  |  |   |                       |  |  |                  |  |                    |  |
| 40. SPECIAL LOADING EQUIPMENT (Towbars, etc.)                                 |  |  |  |   |                       |  |  |                  |  |                    |  |
| 41. REMARKS   |  |  |  |   |                       |  |  |                  |  |                    |  |
| THE ABOVE LISTED ITEMS HAVE BEEN INSPECTED FOR PROPER SHIPPING CONFIGURATION. |  |  |  |   |                       |  |  |                  |  |                    |  |
| 42. DEPLOYING FORCE REPRESENTATIVE (Signature/Rank/Unit of Assignment)        |  |  |  |   |                       | 43. MOBILITY FORCE INSPECTOR (Signature/Rank/Unit of Assignment) |  |                  |  |                    |  |

DD FORM 2133, OCT 1998 (EG)

Figure E-2. DD Form 2133, Joint Airlift Inspection Record

## INSTRUCTIONS

### 1. RESPONSIBILITIES

- 1.1. Qualified TALCE/CDR or aerial port personnel are responsible for acceptance of cargo for airlift
- 1.2. The deploying unit is responsible for the preparation of cargo, including weighting, marking, palletization, and the preparation of all documentation.
- 1.3. The joint inspection, including documentation and inspection of all items prepared for air shipment, must be accomplished prior to loading. This inspection will be performed by qualified TALCE/CDF or aerial port personnel with a representative from the transported force.

### 2. INSPECTION PROCEDURES

- 2.1. All inspections will be conducted by qualified inspectors and transported force representatives. The TALCE/CDF or aerial port representative accepting cargo for air shipment must have completed hazardous materials inspector training required in paragraph 1.17.3, AFJMAN 24-204/TM 38-250/NAVSUP PUB 505/MCO P4030.19G/DLAI 4145.3. The completed form will indicate to the aircraft loadmaster that the required inspection has been accomplished.
- 2.2. This form will be used as the source document for joint inspection. Three copies will be completed for each aircraft load and signed by the appropriate personnel.
  - (1) One signed copy will be attached to the aircraft cargo manifest.
  - (2) One signed copy for the TALCE/CDF or aerial port station file.
  - (3) One signed copy for the transported force.

### 3. PREPARATION INSTRUCTIONS

- 3.1. Heading.
  - (1) Block 1, Unit Being Airlifted. Enter the numerical designation and geographic location of the military unit responsible for the equipment being airlifted. For example, 1<sup>st</sup> Tactical Fighter Wing, Langley AFB VA.
  - (2) Block 2, Departure Airfield. Enter the name of the facility the airlifted unit is departing, i.e., Langley AFB VA.
  - (3) Block 3, Date. Day, month and year that the inspection is accomplished.
  - (4) Block 4, Aircraft Type and Mission Number. Enter the aircraft type on which the equipment is to be loaded and the airlift mission number as designated in the plan or operations order.
  - (5) Block 5, Load/Chalk Number. Enter the deploying force assigned aircraft load number that establishes the desired load movement sequence.
  - (6) Block 6, Start time. Enter the local time that the inspection was started.
  - (7) Block 7, Complete Time. Enter the local time that the load was checked, and is ready for movement.
  - (8) Block 8, TALCE/CDF. Enter the numerical designation of the unit that has TALCE/CDF or aerial port responsible for the operating location.
- 3.2. Body.
  - (1) Enter the increment/serial/bumper number and type of equipment in the appropriate block. The legend for completing the inspection is contained in the block on the left. Annotate the appropriate entry in the proper column. Make only one entry in each inspection block for each item.
  - (2) Enter items not initially accepted in the remarks section and indicate corrective action.
  - (3) Blocks 42 and 43. Signature must be legible. Indicate the rank and unit of assignment of the individual signing the form.

DD Form 2133 (BACK), OCT 1998

**Figure E-2. DD Form 2133 (Reverse), Joint Airlift Inspection Checklist (Cont'd)**

4. The scale weight certification block will be completed by legibly printing the name, and grade of the individual who performed the weighing of the pallet and the date.

Designed using Perform Pro, WHS/DIRO, Sep 98

III-E-12

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## **APPENDIX F**

### **UNIT AIRLIFT AFFILIATION TRAINING**

#### **A. Affiliation Program.**

1. For the purpose of this regulation, affiliation is defined as the relationship between an Air Mobility Control Unit (AMCU) and designated airlift users throughout Department of Defense (DOD). The affiliation program is designed to develop an understanding of each unit's mission and to promote coordination between air mobility managers and airlift users at all levels. The objectives of the program are:

- a. To provide a joint training program designed to enhance the ability of United States (US) forces to plan and execute a rapid and efficient movement by air.
- b. To establish a liaison between the airlift manager and the moving agency to optimize airlift planning and execution.
- c. To develop a mutual understanding and appreciation of the complexities of both air movement and the unit's activities to prepare for that movement.
- d. To promote joint training in airlift mobility procedures thereby enhancing the capability for an immediate response to contingency airlift requirements.

2. Headquarters (HQ) Air Mobility Command (AMC)/Mobile Command and Control Operations (DOOM) is responsible for overall management of the affiliation program. Each AMCU is responsible for executing the affiliation program with their assigned affiliates. Each Service will ensure that an affiliation training manager or validator is appointed at the major command or equivalent level. Affiliation program managers are responsible for:

- a. Identifying, to HQ AMC/DOOM, those units who require affiliation training.
- b. Identifying, to HQ AMC/DOOM, those points of contact (POC) for units to be affiliated.
- c. Attending the HQ AMC affiliation program managers' conference.

NOTE: AMCU also includes Air Mobility Squadrons, Air Mobility Control Flights, Airlift Control Squadrons, and Airlift Control Flights (ALCF), unless otherwise stated. All references to AMCU apply equally to both Air National Guard (ANG) and United States Air Force Reserve (USAFR) ALCFs. References to Tanker Airlift Control Elements apply equally to mission support teams (MST) unless otherwise noted.

3. Units desiring to become affiliated should forward their initial request to the affiliation training manager/validator for Service approval. Once approved, the request must be forwarded to HQ AMC/DOOM affiliation management for final determination.

4. Each affiliated unit will be assigned an affiliation category. Affiliation categories consist of Types I through VII. Types I, II, III, IV, align AMC active duty AMCU with active duty units. Type V units can be active duty or ANG and USAFR Component units. Normally these units will not meet the requirements for classroom training. However these are units that have a wartime mission, and because of this, they are entitled to an affiliation relationship. Types VI and VII designate USAFR and ANG units. Designation of an affiliation type designates the frequency and amount of training the user unit may require to maintain its deployment capability. It has no direct correlation with a unit's wartime or contingency mission. Class quotas for each type and prerequisites for each course of training ("Phase I, Equipment Preparation Course," and "Phase II, Airlift Planners Course") are discussed in Paragraph B.2.a.-c. below. If units desire static load training, they must coordinate the request with their affiliated AMCU. They must also submit a request for aircraft at a Joint Airborne/Air Transportability Training (JA/ATT) planning conference 60 days in advance of the actual date desired. Static load training should be held in conjunction with equipment preparation training or planned unit/base mobility exercises. Class frequencies for each affiliation type are conducted as follows:

- a. Type I-Training is authorized four times per fiscal year (FY).
- b. Type II-Training is authorized two times per FY.
- c. Type III-Training is authorized once per FY.
- d. Type IV-Training is authorized only when the affiliated unit is scheduled to participate in known operations.
- e. Type V-This category applies to units affiliated with HQ AMC and to units that may not have a classroom training requirement but have a wartime tasking and are entitled to an affiliated unit relationship.
- f. Type VI-Training is authorized once per FY.
- g. Type VII-Training is authorized only when affiliated unit is scheduled to participate in known operations.

NOTE: Special training needs for all types will be considered upon request but are subject to AMCU instructor availability and must be coordinated with HQ AMC/DOOM and the Tanker Airlift Control Center/Mission Support.

5. AMCU's will conduct command and staff orientation visits to affiliated units when initial affiliation occurs. They should take place as soon as possible after initial notification, but in no case will visits occur later than six months after affiliation, and always before the first scheduled training.

- a. Orientation briefing should be attended by user unit commanders; logistics personnel; mobility officers and noncommissioned officers, Departure/Arrival Airfield Control Groups, United States Navy and United States Marine Corps embarkation personnel; and United States Air Force deployment control center personnel. During these visits the affiliation program is

outlined in general terms with specific guidance on available training, scheduling, and program policies and procedures.

b. Each AMCU will provide assistance visits to their affiliated units during selected mobility or deployment exercises subject to the availability of AMCU personnel. During these visits, affiliation training team personnel will assist inspectors or participants at the affiliated unit commander's discretion, depending on whether exercise objective is oriented toward evaluation or instruction. Affiliation training team personnel will determine if load plans are correct, note discrepancies, and assess equipment marshalling, preparation, and documentation procedures. On-the-spot instruction or correction may be provided at the discretion of the affiliated unit commander. Affiliation training team personnel will identify unsafe conditions or actions and intercede where necessary to prevent personal injury or damage to equipment. An "after-action" report will be written and provided to the supported unit commander, the AMCU commander, and to the HQ AMC/DOOM affiliation manager.

## B. Affiliation Training

1. Affiliated Training Program POC. The affiliated unit POC is the focal point between the AMCU and the unit receiving the training. The POC must ensure students have a valid need for the training. Also, the POC retains overall responsibility for coordinating unit training regardless of who is assigned the task of procuring facilities, equipment, etc.

2. Initial Training. Classroom instruction provides the central focus for the affiliation training program, and provides an informal working level forum for exchange of information. Training is provided at the airlift user's facility and must meet AMCU standards for an effective classroom environment. One course taught in two phases provides the student with necessary knowledge to safely and efficiently plan unit airlift requirements.

a. Phase I (Equipment Preparation Course). This training is designed to educate personnel (E-4 and below) in the mechanics of preparing cargo, equipment, and personnel for cargo aircraft loading. Although this course is designed for individuals (E-4 and below) who will actually prepare, load, and tie down unit equipment, any unit individual may attend. All class members will be expected to participate in the total preparation and loading exercise.

(1) The course consists of 16 hours (two days) of academic instruction at the affiliates' home base. AMC Affiliation Workbook 36-101 Volume I, Equipment Preparation Course and AMC Affiliation Workbook 36-101 Volume II, Airlift Planner's Course, the standard AMC syllabus, lesson plan, and visual aids package are used to teach the course. Successful completion and receipt of the training certificate recognizes the student has been trained to prepare unit cargo for air shipment but does not authorize student to sign or validate aircraft cargo manifests.

(2) Although not absolutely necessary, units are encouraged to schedule a static load aircraft with Phase I training. Practical experience gained in preparing, marshalling, and loading an actual aircraft reinforces information presented in the academic portion.



(3) Unless a maximum number of students are previously coordinated with the AMCU responsible for administering training, a maximum of 50 students or a minimum of 10 are allowed for Phase I training.

b. Phase II, (Airlift Planner's Course). This training is designed to educate unit movement officers and supervisory personnel (E-5 or above) in airlift planning and execution of joint combat airlift operations. Individuals not fitting within the rank structure may be admitted by submitting written verification from their commander indicating they are active participants in the load-planning phase of airlift operations. Personnel attending this course must have a minimum retainability in the logistics duty position of one year. They must be totally committed to training and not assigned additional duties or appointments that would cause absence from class or distract from the learning environment.

(1) The course consists of 48 hours (six days) of academic instruction at the affiliates' homebase. AMC Affiliation Workbook 36-101 Volume I, Equipment Preparation Course and AMC Affiliation Workbook 36-101 Volume II, Airlift Planner's Course, standard AMC syllabus, lesson plan, and visual aids package are used to teach the course. Successful course completion, receipt of training certification, and AMC Form 9, AMC Airlift Load Plan Certification, constitutes authorization for planning official to sign aircraft cargo manifests for air shipment of unit cargo and personnel.

(2) The Airlift Planner's Course is not designed to be used in conjunction with a JA/ATT or other static load aircraft due to duration and complexity of academic instruction and because the intended audience would not be expected to routinely load aircraft.

NOTE: To attend Phase II training, students must have successfully completed Phase I training. (Exception: Air Combat Command affiliated units are exempt from Phase I training provided students attend a host-base equipment preparation course and material covered meets affiliation training Phase I requirements).

c. Unless a maximum number of students is previously coordinated with the AMCU responsible for administering training, a maximum of 25 students or a minimum of 10 are allowed for Phase II training.

d. If training objectives cannot be met, AMCU affiliation instructors may cancel training. However, they must first consult the theater airlift liaison officer or AMC Liaison Officer and/or the installation office of primary responsibility for affiliation program management.

e. Classes with less than 10 students, inadequate facilities, equipment not prepared for air shipment according to established procedures, insufficient quantities of equipment to support training needs, or delays precluding efficient use of remaining allocated time all constitute justification for cancellation. This will preclude issuance of training completion certificates. Students attending classes, canceled prior to completion, must be rescheduled to attend another class in its entirety.

f. Graduates of Phase II will be certified as aircraft load planners with certification valid for 24 months. AF Form 1256, Certificate of Training, and the AMC Form 9, AMC Airlift Load

Plan Certification (Figure F-1) will serve as source documents. Recertification may be accomplished by completing an initial affiliation-training course, attending refresher/recertification training, or attending a Service school authorized to certify aircraft load planners.

3. Refresher/Recertification Training. Prior to scheduling yearly training, each AMCU will contact affiliated units to inform them of when refresher/recertification training will be offered. Unit POCs are encouraged to monitor certification expiration dates of all assigned personnel who are load planning certified. A one day refresher/certification will be offered prior to the start of Phase II training. A written exam and a practical exercise will be administered. Upon completion, students will be issued a new AMC Form 9, which will be valid for 24 months. Students who do not successfully complete this training will be decertified and must attend an initial course.

4. Service Schools. All policies that apply to affiliation training also apply to Service schools. As authorized and directed by HQ AMC, the following Service schools are authorized to certify aircraft load planners:

- a. Expeditionary Warfare Training Group Pacific, San Diego, California.
- b. US Army's Joint Strategic Deployment Training Center's, Air Deployment Planning Course, Ft. Eustis, Virginia.
- c. 82d Airborne Division, Advanced Airborne School, Ft. Bragg, North Carolina.
- d. 101st Airborne Division (Air Assault), Strategic Deployment School, Ft. Campbell, Kentucky.

| AMC AIRLIFT LOAD PLAN CERTIFICATION          |                           |
|--|---------------------------|
| NAME ( <i>Last, First, MI</i> )              | ORGANIZATION              |
| NAME OF CERTIFIER ( <i>Last, First, MI</i> ) | ORGANIZATION OF CERTIFIER |
| SIGNATURE                                    | DATE                      |
| EXPIRATION DATE                              | LOCAL CONTROL NUMBER      |
| REMARKS                                      |                           |

AMC FORM 9, MAR 93

**Figure F-1. AMC Airlift Load Plan Certification**

## **APPENDIX G**

### **DUTIES OF TROOP COMMANDER** **(PLANELOAD COMMANDER OR CHALK LEADER)**

A. The troop commander will obtain confirmation and follow the checklist in performing these duties.

B. Checklist: The troop commander (planeload commander or chalk leader) will:

1. Brief passengers on availability of flight insurance.
2. Be present at the passenger briefing for the flight.
3. Check all passengers for unauthorized materials that could present a flight hazard, e.g., ammunition, lithium batteries, fuel, etc. NOTE: Recommend establishing an amnesty box in the marshalling or alert holding area.
4. Assume control of all passengers listed for movement on the flight and ensure all are informed of formations, expected departure, and reporting time.
5. Be readily available to the Departure Airfield Control Group (DACG) at all times. Personnel will not be dismissed without the approval of the DACG.
6. Perform a personnel roll call prior to loading to ensure everyone is present for the flight. Report no-show passengers to the DACG so the manifest can be corrected. NOTE: Coordinate time of roll call with DACG.
7. Ensure personnel have placed their baggage on the proper vehicle or 463L pallet for movement to the aircraft.
8. Load passengers under the supervision and guidance of the loadmaster. Ensure each individual appearing on the manifest boards the aircraft. Maintain planeload or troop commander's or chalk leader itinerary as shown in Figure G-1. The itinerary may be in narrative form or any form the planeload or troop commander or chalk leader selects. Provide complete itinerary to the Arrival Airfield Control Group upon arrival at destination or return to DACG via chain of command.
9. Brief all passengers on maintaining security of their personal belongings. If a passenger is removed from the flight, ensure the passenger's baggage is also removed. Conduct anti-hijack inspection of all assigned troops and certify completion of inspection in block 6 of DD Form 2131, Passenger Manifest (Figure D-23), or automated manifest. Keep one copy of manifest for deploying unit's records and give two copies to the DACG.
10. Collect all weapons, magazines (if not empty), and unsecured/non-palletized ammunition before the anti-hijack briefing. (See Figure G-2.) On arrival at the aircraft, the troop commander must brief the loadmaster on ammunition and assist the loadmaster, as directed, in the tie-down

before departing. Munitions will be redistributed on arrival at destination. A Shipper's Declaration for Dangerous Goods is not required.

11. Maintain in-flight discipline of all passengers.
12. If in-flight rations are issued, control the issue to troops.
13. Help maintain cleanliness and safety in the aircraft.
14. At en route stations, determine ground time from the loadmaster and ensure all passengers are present to meet flight departure times. Know which passengers will be offloaded should it become necessary to take such action at an en route station. Before departure from the en route station, conduct another anti-hijack inspection.
15. Brief passengers regarding local restrictions and conduct at en route stops.
16. Coordinate for billeting and food at en route stations for personnel. Service Memorandum of Understanding requires installations to provide these services on a reimbursable basis.
17. During en route servicing stops, designate a guard for personal effects or other equipment that must remain with the aircraft. Coordinate feeding of security personnel. Arrange for security coverage through base facilities when unusually long delays are encountered.
18. Ensure awareness of composition of, and location of, hazardous material on aircraft, if any.
19. Upon arrival at destination, maintain control of the passengers and assist with offloading baggage and/or cargo.
20. If the troop commander has authorized troops to hand-carry weapons (including knives and knife-like items) aboard the aircraft (See Appendix C, Paragraph B.3), ensure a final walk-through of the aircraft is completed after all passengers have deplaned to retrieve any weapons that may have been left behind.

### **PLANELOAD/TROOP COMMANDER'S/CHALK LEADER ITINERARY**

#### **1. Passenger Briefing.**

- a. Person performing briefing.
- b. Location of briefing.
- c. Date and time.
- d. Passenger loading.
- e. Aircraft model and number.
- f. Manifest number.
- g. Number of passengers loaded.

#### **2. Aircraft Itinerary.**

- a. Aircraft departure date and time.
- b. Airport departed from.
- c. First stop en route.
- d. Date and time of first stop.
- e. Date and time aircraft departed from first stop.
- f. When and where the aircraft arrived and departed at any other stops.
- g. When and where passengers were off-loaded and reloaded en route.
- h. Delays en route.
- i. Reason for delays en route.
- j. Signature of the planeload or troop commander including rank, social security number, and unit.

NOTE: All times should be "ZULU" times.

**Figure G-1. Planeload/Troop Commander's/Chalk Leader Itinerary**

## **PROHIBITED ITEM BRIEFING**

1. You may not take any of the following items under any circumstances:
  - a. Shotguns with barrels under 18 inches long.
  - b. Rifles with barrels under 16 inches long.
  - c. Automatic weapons.
  - d. Switchblade knives.
  - e. Brass knuckles.
  - f. Incendiary devices, e.g., flares.
  - g. Tear gas or mace.
  - h. Gunpowder, cartridges, or primers.
  - i. Other hazardous materials e.g. butane fuel canisters.
2. If directed by the Operations Plan or Operations Order, (unless otherwise restricted by foreign government regulations), you may ship unloaded government weapons in checked baggage. You may not carry any unauthorized weapons, explosive devices, or hazardous materials on board the aircraft. Knives, knife-like items, and devices which include a knife will be placed in checked baggage. If you have any such items, declare them now. Tell us now if you have an authorized weapon in your checked baggage so we can take custody and make sure it's guarded until loaded on the aircraft. Weapons count against your authorized weight allowance.
3. All government issued hazardous materials to include explosives and ammunition, must be declared. Hazardous materials may not be taken into the passenger compartment of a commercial aircraft. The troop commander and/or his aircraft loadmaster will direct loading of hazardous materials on military aircraft.
4. Flashbulbs are prohibited in checked baggage, but may be hand carried. You may hand carry a camera, but flash attachments of any type, i.e., bulbs, cubes, strobe, etc., cannot be used on the airplane. Aircraft loadmaster and/or flight attendants will provide specific instructions on use of electronic, battery-operated equipment onboard aircraft.
5. Ration heaters may never be opened or used to heat MREs during flight.
6. You cannot ship alcoholic beverages in checked baggage, but may hand carry up to one (1) US gallon of these beverages, unless the Department of Defense Foreign Clearance Guide states otherwise. It does not matter if the container has been opened, but you cannot drink these beverages on the airplane. Individuals who are obviously intoxicated will not be allowed on board. If you intend to carry alcoholic beverages, you must comply with all foreign, federal, state, and local laws, regulations, and status-of-forces agreements.
7. You may not ship or carry illegal drugs, hallucinogens, or other items prohibited by US Customs

**Figure G-2. Prohibited Item Briefing**

## **APPENDIX H**

### **DEPARTURE AIRFIELD CONTROL GROUP (DACG) CHECKLIST**

A. The DACG commander or Office in Charge will:

1. Brief all personnel engaged in DACG operations.
2. Establish required communications.
3. Obtain parking and flow plan from the mobility force.
4. Coordinate Materials Handling Equipment (MHE) with the mobility force.
5. Ensure sufficient load team personnel and pusher vehicles are available to accomplish mission.

B. The DACG officer will:

1. Coordinate with the mobility force to ensure personnel, cargo, and equipment are escorted to the correct aircraft.
2. Inform liaison officers of changes to the movement plan.
3. Brief deploying units on the vehicle flow plan.
4. Maintain status of arrival, departure, and loading of chucks.
5. Obtain airfield diagrams for guides.
6. Ensure communications are operational between all elements of the DACG.
7. Ensure support equipment, wreckers, petroleum, oil, and lubricants, food service, lighting, first aid materials, weighing devices, and maintenance teams are available.
8. Determine and coordinate crash, fire, and rescue protection requirements.
9. Coordinate movement of the deploying unit's aircraft mission loads (chucks) through the areas of activities.

C. The alert holding area officer will:

1. Coordinate with other DACG personnel.
2. Coordinate with unit liaison officers.
3. Coordinate with the call forward area officer.

4. Issue any special instructions for alerted aircraft loads.

D. The call forward area officer will:

1. Receive instructions from the DACG.
2. Inspect all loads upon receipt from alert holding area and ensure they are Joint Inspection (JI)-ready.
3. Inspect passenger and cargo manifests and make corrections.
4. Participate in the JI.
5. Inform the DACG of problems affecting movement schedule.
6. Coordinate MHE with the DACG.
7. Check and collect manifests and deliver to the DACG.
8. Escort personnel and equipment from aborted aircraft to alternate aircraft or temporary holding area.
9. Keep the DACG informed of problems that would affect the movement schedule.

E. The unit or DACG administration officer will:

1. Assist in preparation of or changes to passenger and cargo manifests.
2. Act as safety representative for units involved in movement operations--ensure all units are briefed.
3. Ensure all incidents and accidents are investigated and reports prepared.
4. Ensure personnel and related services are provided by the base/installation for deploying units.

F. The logistics officer will:

1. Ensure logistics requirements for the DACG are provided.
2. At origin, en route, and destination provide deploying units (directly or with point of contact for logistics support) with the following:
  - a. Water supply points.
  - b. Ration supply points.
  - c. Latrine and shower facilities.



- d. Fuel supply and fuel drainage area.
  - e. Billeting.
3. Secure and supervise maintenance support and facilities for the DACG and deploying units.
- G. The statistics officer will:
- 1. Compile pertinent data required by the DACG.
  - 2. Coordinate with the mobility force on reports required by higher headquarters. Reporting will include, but not be limited to the following:
    - a. Personnel and equipment that have departed the departure airfield for the objective area.
    - b. Number of aircraft available for loading.
    - c. Number of aircraft required to complete lift.
    - d. Number of aborts.
    - e. Troops and equipment available for loading.
    - f. Automated intransit visibility interface.

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## **APPENDIX I**

### **MARSHALLING AREA**

A. **Marshalling Process.** Marshalling is the process by which units move to a temporary area near the port of embarkation (POE) and complete preparations for aircraft and/or ship loading. The marshalling area is the area from which the movement operation is initiated and includes the temporary area and support facilities.

B. **Planning.** Staff planning in this phase provides for the relief of deploying forces from all possible support functions to permit concentration on preparations for the movement. Support agencies designated by the unified command should provide the bulk of the administrative assistance including transportation, communications, and housekeeping details. Also, when required, support agencies provide local security personnel for supplementing host installation security of the departure POE. The support installation should prepare detailed marshalling plans with instructions for providing facilities and services, conducting briefings, and for moving units to the site.

C. **Selection of Marshalling Areas.** The selection of marshalling areas is based on the POE locations and the movement plan. Marshalling areas should be as close to the POE as feasible. However, they should be far enough away to avoid concentration of forces and congestion at the POE.

D. **Preparation.** Units should maximize preparation before arriving at the marshalling area, which will be used for final preparations. Using a marshalling area allows rapid clearing of the POE and makes aircraft/vessel loading space available for its primary purpose.

E. **Responsibilities within the Marshalling Area.**

1. The support installation/host activity will:

- a. Designate and control the marshalling area.
- b. Provide necessary support functions to allow the deploying unit to concentrate on deployment preparations.
- c. Provide emergency maintenance, petroleum, oil, and lubricants (including defueling capability), and related services.

2. The deploying unit will:

- a. Conduct final preparations for loading.
- b. Assemble vehicles, equipment, supplies, and personnel into mission loads/chalks or in convoy order, for movement to the POE.
- c. Prepare personnel and cargo manifests.

- d. Prepare any additional required paperwork, e.g., hazardous certification, agricultural certification.
  - e. Appoint and brief planeload or troop commanders for departure from the POE.
  - f. Ensure adequate shoring and dunnage material for aircraft loading is readily available.
  - g. Provide personal safety equipment to load team members.
  - h. Brief personnel on the situation and mission, movement plan, assembly plan, operational plan, convoy discipline, loading procedures, safety, and assembly procedures.
  - i. Provide liaison with activities agreed to during the joint planning conference.
3. The Departure Airfield Control Group (Aerial Port of Embarkation (APOE) only) will:
- a. Arrange for technical assistance.
  - b. Provide liaison with the deploying unit and mobility force.
4. The mobility force (APOE) will:
- a. Provide technical assistance.
  - b. Provide aircraft scheduled departure times.

NOTE: Above applies to all Services except manifesting procedures for Army at seaports where personnel accompanying cargo and supercargo personnel will be manifested by the terminal operating unit or by the deploying unit Service deployment systems.

## **APPENDIX J**

### **ALERT HOLDING AREA (AHA)**

A. General. The Alert Holding Area (AHA) is the vehicle, equipment, supply, and personnel control area. The AHA is under the control of the Departure Airfield Control Group (DACG). It should be located near the departure airfield. It is used to assemble, inspect, hold, and service aircraft loads. Specific responsibilities within the AHA are as follows:

B. Deploying units will:

1. Move aircraft loads from the marshalling area upon notification from the DACG.
2. Ensure aircraft mission loads arrive at prescribed times.
3. Provide the DACG with load plans, passenger manifest, cargo manifest, and other required documentation.
4. Correct load discrepancies identified during pre-inspection.

C. The DACG will:

1. Coordinate arrival of the mission loads with the deploying unit.
2. Receive, inventory, and control aircraft loads.
3. In conjunction with deploying unit personnel, inspect aircraft mission loads to ensure they are complete and correctly prepared.
4. Establish a discrepancy correction area for cargo and documentation.
5. Inspect documentation for accuracy and completeness.
6. Ensure passengers are accounted for and available.
7. Provide emergency maintenance, petroleum, oil, and lubricants (including defueling capability), and related services.
8. Establish traffic flow pattern.
9. Establish communication with deploying unit(s) and mobility forces. Establish back-up communication with the mobility forces.
10. Direct or guide the mission loads to the call forward area.
11. Provide a liaison individual to the mobility force (normally the Air Terminal Operations Center).

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## **APPENDIX K**

### **CALL-FORWARD AREA**

A. General. The Departure Airfield Control Group (DACG) and the mobility force control the call-forward area. In this area, the joint inspection (JI) is conducted, a final briefing is provided to the deploying troops, and manifests are reviewed for accuracy. Specific responsibilities in the call-forward area are as follows:

B. The deploying unit will:

1. Correct all discrepancies found by the DACG or mobility force.
2. Adhere to the established movement timetables.
3. Ensure the complete chalk is available.
4. Participate in the JI.
5. Provide final manifest to DACG/mobility group and electronically transmit to the Global Transportation Network (GTN) and downline stations.

C. The DACG will:

1. Perform the JI of aircraft mission loads and manifests with the deploying unit and mobility force.
2. Ensure passenger and cargo manifests are correct.
3. Escort prepared aircraft loads forward to the ready line segregated by load.
4. In the event of airlift abort or discrepancies in the allowable cabin load, reassemble aircraft loads with the assistance of the mobility force and make required manifest changes.
5. Ensure the deploying unit corrects JI discrepancies.
6. Maintain statistical data to account for the current status of all vehicles, equipment, supplies, and personnel in aircraft loads.
7. Ensure the deploying unit adheres to the established movement timetables.
8. Provide loading team personnel and support equipment.
9. Ensure all personnel are briefed on flight line safety, to include driving procedures, smoking rules, hand signals, and any local special precautions.
10. Retain a copy of corrected passenger and cargo manifests and inspection records.

11. Provide a liaison individual to the mobility force (normally the Air Terminal Operations Center).

12. Provide fueling, defueling, and emergency maintenance capabilities for deploying unit equipment.

13. Establish and operate a passenger-holding area.

14. Escort passengers to the aircraft.

D. The mobility force will:

1. Coordinate all airflow information and aircraft configuration changes with the DACG.

2. Perform a visual check of cargo and, if necessary, make minor adjustments prior to placing cargo on materials handling equipment.

3. Brief drivers and passengers on flight line safety, driving procedures, smoking rules, and special precautions, e.g., engine running onload/offload procedures, etc.

4. Provide a team chief for each loading team.

5. Notify the DACG to dispatch loads to the ready line.

6. Accept loads at the ready line and load the aircraft.

7. Ensure deploying units comply with foreign and United States customs, agricultural, and immigration procedures.

8. Ensure electronic manifests are prepared and forwarded to GTN and downline stations.



## **APPENDIX L**

### **READY LINE/LOADING RAMP AREA**

A. General. The ready line/loading ramp area is where vehicles, equipment, supplies, and personnel are received from the call forward area and loaded aboard the aircraft. It is under the control of the mobility force and must be treated as a sterile area. Any changes made at this point will require a new Joint Inspection be accomplished. Specific responsibilities in the ready line/loading ramp area are as follows:

B. The deploying unit (through the planeload or troop commander) will:

1. Follow the directions of the load team chief or passenger escort.
2. Monitor control of the aircraft mission load or passengers.
3. Retain one copy of the final cargo and passenger manifests.
4. Provide assistance in loading and securing the aircraft load.
5. Ensure vehicle drivers and equipment operators follow the instructions of the load team chief or primary loadmaster, while loading and restraining equipment on the aircraft.

C. Departure Airfield Control Group (DACG) will:

1. Pass control of the aircraft mission loads to the mobility force.
2. Escort cargo and passengers to the aircraft as directed by the mobility force (Air Terminal Operations Center).
3. Maintain coordination with the deploying unit representative and mobility force.
4. Obtain individual aircraft load completion times from the mobility force.
5. Ensure shoring, floor protection materials, and 463L dunnage are on-hand and ready for use.
6. In the absence of mobility forces, perform functions identified under mobility forces.

D. The mobility forces will:

1. Accept plane loads from the DACG at the ready line.
2. Ensure all drivers are briefed on flight line safety, driving procedures, smoking rules, and special precautions.
3. Ensure each mission load is positioned at the proper aircraft at the specified time.

4. Maintain liaison with the aircraft and DACG.
5. In coordination with the loadmaster, ensure loads are placed aboard the aircraft.
6. Provide and operate materials handling equipment and special loading equipment according to agreements established during the joint planning conference.
7. Provide the required copies of the passenger and cargo manifests to the loadmaster.
8. Retain a copy of the passenger and cargo manifests.
9. Accomplish all required air crew briefings.
10. Prepare and maintain statistical record of arrivals, departures, loading time, tonnage, and other pertinent data.

E. The Load Team Chief will:

1. Receive the load at the ready line.
2. Direct and supervise the loading team.
3. Ensure load team members have personal safety protection.
4. In conjunction with the loadmaster, direct loading operations, and ensure all cargo and equipment are properly restrained in the aircraft.
5. Coordinate with the mobility force ready line coordinator for any special assistance or equipment needed.
6. Collect required copies of the passenger and cargo manifests.
7. Pass load completion times to the mobility force control center.

## **APPENDIX M**

### **ENGINE RUNNING ONLOAD/OFFLOAD (ERO) PROCEDURES FOR C-130, C-141, C-17, AND C-5 AIRCRAFT**

A. Scope. The Mobility Force Commander (MFC) may authorize EROs to expedite the flow of aircraft through airfields during all airland operations where the reduction of ground time warrants a departure from normal operating procedures.

B. ERO operations may be conducted, provided:

1. The on/offload airfield is transited on an operational stop basis and no safety of flight conditions exist.
2. The decision to ERO should be properly coordinated between the aircraft commander and any existing local command and control (C2) function (i.e., Command Post, Alternate Mobility Command Center, Tanker Airlift Control Element, Mission Support Team, Arrival/Departure Airfield Control Group (A/DACG), or Combat Control Team) and the affected functional areas.
3. Consider operational risks:
  - a. Type of hazards.
  - b. Assess the risks.
  - c. Analyze risks control measures.
  - d. Make control decisions.
  - e. Implement risk controls.
  - f. Supervise and review prior to approving ERO operations. Evaluate such risks as day/night operations, weather, experience levels, type of cargo, passengers, and location of operations.
  - g. Braking action on the ramp is such that there is no danger of the aircraft sliding with brakes set. Chocks will not be used.
  - h. Normally, the ramp and cargo doors are used for on/offloading. Exception: Circumstances may dictate use of the crew entrance door for on/offloading. This will be coordinated through the aircraft commander, C2 function, and affected functional areas.
  - i. During adverse weather, ensure the vehicle operator's vision is not obscured by the elements. Self-propelled vehicles may require winch assistance if positive traction of vehicle wheels cannot be maintained throughout the on/offload operation. Arctic/nonskid shoring may be used in lieu of a winch.

j. Do not use ERO procedures when explosive cargo is involved (with the exception of small arms ammunition--class/division 1.4) unless authorized by the MFC, contingency operations order, or air tasking orders.

k. Troops are briefed on all safety requirements. Troops must have hearing protection prior to loading/offloading operations.

C. ERO Team. An ERO normally consists of load teams, maintenance, and user personnel formed as one overall and cohesive unit. The number of such teams depends on the number of aircraft anticipated to be on the ground at the same time. Close coordination is required at all times during EROs between air and ground crews. Team structure and equipment:

1. Aircraft Maintenance Team will: Direct and park aircraft, and control the aircraft perimeter. Consist of one marshalling qualified aircraft maintenance parking director and two assistants to ensure proper wing tip clearances are met. NOTE: Airfield or MFC commander may direct use of ERO parking director assistants. Decision to require assistants will be based on airfield conditions (i.e., limited clearance, personnel/equipment, or traffic congestion). Non-maintenance personnel can perform as assistants if wing tip clearance is not critical.

2. Load Team will: Load and offload aircraft with trained ERO individuals. The team will consist of a team chief and additional personnel as determined by the type of aircraft and load.

3. User Personnel will: Consist of A/DACG or the deploying unit personnel. User personnel will assist maintenance teams and load teams to the maximum extent possible.

4. Equipment Requirements:

a. Onload and offload personnel will be equipped with gloves, steel-toed boots, hearing protection, and goggles (goggles are optional for C-17 operations). During hours of darkness or reduced visibility, reflective vests/belts will be worn.

b. Extra sets of C-130/C-141 auxiliary ground loading ramps as required.

c. Vehicle with front mounted pintle hook (prime mover).

d. C-130 ramp support (milk stool).

e. Materials Handling Equipment (MHE).

f. Reflective vests/belts and wands.

5. Briefing Requirements:

a. All personnel involved in the ERO at the aircraft will receive a briefing on procedures and safety prior to beginning ERO operations. The loading team supervisor conducts the briefing. The load team supervisor will brief the loadmaster at the aircraft.

b. The loading team supervisor highlights key topics such as hand signals, route to and from the aircraft, load team position, cargo type, special on/offloading instructions, and use of any MHE. The load team supervisor will check to ensure all personnel and troops have the required safety items (i.e., hearing protection devices, steel-toed boots, etc).

6. Team duties—Onload.

a. Maintenance:

(1) As the aircraft taxis into a parking spot, the parking director and assistants will locate themselves in a position to expeditiously accomplish their assigned tasks.

(2) The maintenance parking director directs the aircraft to the parking spot. After the aircraft comes to a complete stop, clear the area forward of the aircraft and position one person immediately aft and 20 feet (ft) outboard of each wing tip to ensure the area remains clear.

b. Load team:

(1) The load team chief will ensure a combination safety briefing and safety check is conducted prior to the start of ERO operations. Briefing topics include hand signals, route to aircraft, position of load team, type of cargo, specific on/offloading instructions, and use of MHE. Check for personal safety items such as goggles, reflective vests/belts, gloves, ear protection devices, and steel-toed boots. Vehicle and troop directors utilize distinctive clothing/equipment such as reflective vest and wands for night operations. Vehicle operators will remain in their vehicles when within 50 ft of aircraft (C-5: 150 ft, C-17: 25 ft) and until vehicle is secured aboard aircraft with one chain forward and one aft.

(2) Loading team chiefs maintain complete control of their teams, positioning them in a preplanned area clear of engine exhaust, and a minimum of 50 ft aft (C-5: 150 ft, C-17: 25 ft) of the aircraft when it has stopped. The preplanned area should be on the outside of the aircraft's turning radius and clear of engine exhaust.

(3) The loading teams will not approach the aircraft until all engines are in low-speed ground idle or reverse thrust (C-5 loading team does not approach the aircraft until the crew entrance door is deployed and the scanner has deplaned). In all cases, the load team will not proceed to the aircraft until signaled by an aircrew member. NOTE: C-5 load team members will always approach the aircraft from the front. When offloading/onloading pallets through the aft doors of the C-5, the person chocking the k-loader will approach the aircraft from the nose and be escorted to the rear of the aircraft by the scanner.

(4) When the aircraft has stopped and engines are in low-speed ground idle or reverse thrust (on C-5 scanner has deplaned), the load team chief will rapidly position the team via a route that will take them perpendicular to the aircraft's fuselage, at least 50 ft aft (C-5: 150 ft, C-17: 25 ft) of aircraft, until reaching aircraft centerline where they will turn and approach the aircraft. WARNING: Load team personnel will remain clear of aircraft cargo ramp until positioned for onload.

(5) The loading team positions support MHE as required. Trained team personnel install the extra set of aircraft auxiliary ground loading ramps. Team members may assist the aircraft loadmaster in positioning stabilizer struts. **WARNING:** When unloading and offloading, or transporting pallets on forklifts with rollerized tines, secure pallets to the forklift during movement.

(6) Under the direction of the team chief, with the exception of the C-5, vehicle operators will position loads a minimum of 50 ft (C-17: 25 ft) aft and slightly to the right or left of aircraft fuselage, leaving a clear path behind the aircraft. The preferred method for offloading/unloading the C-5 is in the forward kneel, drive in position. (C-5 loads will be positioned a minimum of 150 ft forward and aft and slightly to the right or left of the aircraft fuselage). Only one piece of loading equipment is to be directed to approach the aircraft at any given time.

(7) The aircrew loadmaster retains overall responsibility for loading aircraft. The load team chief will coordinate with aircrew loadmaster to present manifest, discuss load sequence, ground vehicle direction, and tie-down requirements.

(8) Load team personnel will go aboard and assist in preparing the aircraft for a specific load. Other personnel position the first piece of equipment to be loaded at the bottom of the aircraft cargo ramp.

(9) The ground vehicle director takes a position clearly visible to the vehicle driver. **NOTE:** If trailers are pushed aboard, the vehicle director takes a position next to the driver's side cab of the prime mover.

(10) Positioning the load inside the aircraft requires load team members' assistance in observing load clearance.

(11) When cargo onload is complete, except for ramp load, troops are directed aboard by the troop commander. All personnel are to remain a minimum distance of 50 ft (C-5: 150 ft, C-17: 25 ft) from aircraft until reaching aircraft centerline where they will be directed by the team chief to the aircraft. Ramp loading will be completed after all troops are onboard.

(12) Trained team members may assist C-141 aircrew loadmaster in relieving stabilizer strut pressure and stowing of struts. Loading teams assist in stowing the auxiliary loading ramps on the aircraft cargo ramp and placement of extra auxiliary loading ramps in ERO team vehicle. When the aircraft is secured, the team chief stops 50 ft aft (C-5: 150 ft fwd or aft, C-17: 25 ft) on aircraft centerline and signals with thumb up to inform the aircrew loadmaster the load team and equipment are all clear of aircraft.

#### 7. Team duties—offload.

a. Maintenance. Same as onload.

b. Load team. Same as onload with the additional requirements outlined below. **WARNING:** Load team personnel will remain clear of aircraft cargo ramp until positioned for offload.

(1) If troops are aboard, they are deplaned at the direction of the aircraft loadmaster. Instruct troops to proceed a minimum of 50 ft aft (C-5: 150 ft forward and aft, C-17: 25 ft aft) of the aircraft before turning left or right and continue parallel to the aircraft's wing a minimum of 300 ft (C-17: 200 ft) before stopping.

(2) Team chief will coordinate offload procedures and conditions with the aircrew loadmaster and receive manifests.

(3) Additional team members position themselves to the side of the aircraft ramp until all troops have deplaned. Team chief directs team aboard to remove any remaining tiedown restraints, beginning with the first vehicle to be offloaded and working forward or aft for specific aircraft.

(4) The ground vehicle director takes a position 25 feet to the rear of the aircraft and directs vehicles 50 ft aft (C-5: 150 ft forward and aft, C-17: 25 ft aft) before turning to left or right to the receiving area.

(5) Offloading team departs aircraft after ensuring all tiedown equipment is positioned on aircraft centerline and auxiliary loading ramps are placed on the aircraft ramp as required. (C-5--stow tiedown in containers during kneeling and unkneeling if time permits.)

(6) Trained team members may assist C-141 aircrew loadmaster in relieving stabilizer strut pressure and stowing of struts. Offloading team assists in stowing the auxiliary loading ramps on the aircraft cargo ramp and placement of extra auxiliary loading ramps in ERO team vehicle.

(7) When aircraft is secured, the team chief stops 50 ft (C-5: 150 ft forward or aft) aft of aircraft centerline and gives thumbs up to inform aircrew loadmaster the team and equipment are all clear of aircraft.

c. Troop Loading/Offloading.

(1) Exiting through the aft cargo door and ramp is the preferred method when troops are involved on the C-130, C141, and C-17. The preferred method for the C-5 is through the forward ramp. Deplane passengers before offloading cargo and load passengers after unloading cargo, unless cargo size and location dictate otherwise.

(2) Troops being unloaded and offloaded will be briefed on the hazards involved with ERO procedures. Minimum items that should be briefed include securing loose articles, hearing protection, and any local conditions, etc.

(3) Crew entrance door loading/offloading will be in accordance with publications.  
NOTE: Deplaning personnel must be briefed to remain forward of the extended interphone cord.  
WARNING: When loading or unloading personnel, baggage, or equipment through the crew entry door with engines operating, stay clear of engine inlets. Secure all loose personal items before passing in front of operating engines. Personnel will not proceed aft of the crew entrance door while engines are operating

(4) When offloading troops through the front crew door, troop buses will park in front of the aircraft on the left side with the nose of the bus pointing away from the aircraft, and no closer than 50 ft (C-5: 150 ft) forward of the left wing movement.



## **APPENDIX N**

### **AIRBORNE AND AIR DELIVERY OPERATIONS**

A. The following provides general guidance for the conduct of airborne and air delivery operations. Service publications and references listed at the beginning of this regulation, Part III, provide more definitive guidance.

B. Airlift operations involves the air transport and delivery of personnel, equipment, and supplies into an objective area. Airdrop or aircraft landing(s) may accomplish the delivery. Airlift operations may be comprised of:

1. Airborne Forces. An operation involving the air movement into an objective area of forces and their logistic support for execution of a tactical or strategic mission. For further information, refer to Chapter 8, Section I, of FM 100-27 USA/USAF Doctrine For Joint Airborne And Tactical Operations.

2. Air Delivery. Delivery of supplies and equipment by airdrop. For further information, refer to Chapter 8 of FM 100-27.

3. Aircraft Landing(s). Air movement in which personnel, supplies, and equipment land at a designated destination and are off-loaded for further deployment or distribution. For further information refer to Chapter 9 of FM 100-27 and Chapter 302 of this regulation.

C. Airborne and air delivery follows the same concepts of airlift loading operations described in Chapter 302. There are two typical types of assault zone operations (airborne and/or air delivery locations); Drop Zone and Landing Zone.

1. Drop Zone: A pre-selected area for air dropping personnel, equipment, and supplies.
2. Landing Zone: A pre-designated airfield for assault landings.

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## **APPENDIX O**

### **CENTER OF BALANCE (CB) DETERMINATION – FINDING CB**

A. Determination. The CB of cargo must be determined to accurately compute the weight and balance condition of a loaded aircraft. The agency offering cargo for air shipment is responsible for marking each item with the correct gross weight and a CB point. This includes any item measuring 10 feet or longer and/or any item having a balance point other than its center. All vehicle type cargo will have axle weights marked above each axle, on both sides of vehicle, with weather resistant material. Vehicle-type cargo with a load-carrying capability will be marked indicating an empty or loaded CB. Items not properly marked as outlined herein will not be accepted for airlift since unknown weight and CB represents an unsafe condition relative to aircraft weight and balance. NOTE: Trailers and associated prime movers must be individually marked, even if they are connected on the aircraft. This precludes delays when vehicles must be disconnected or shipped on separate aircraft.

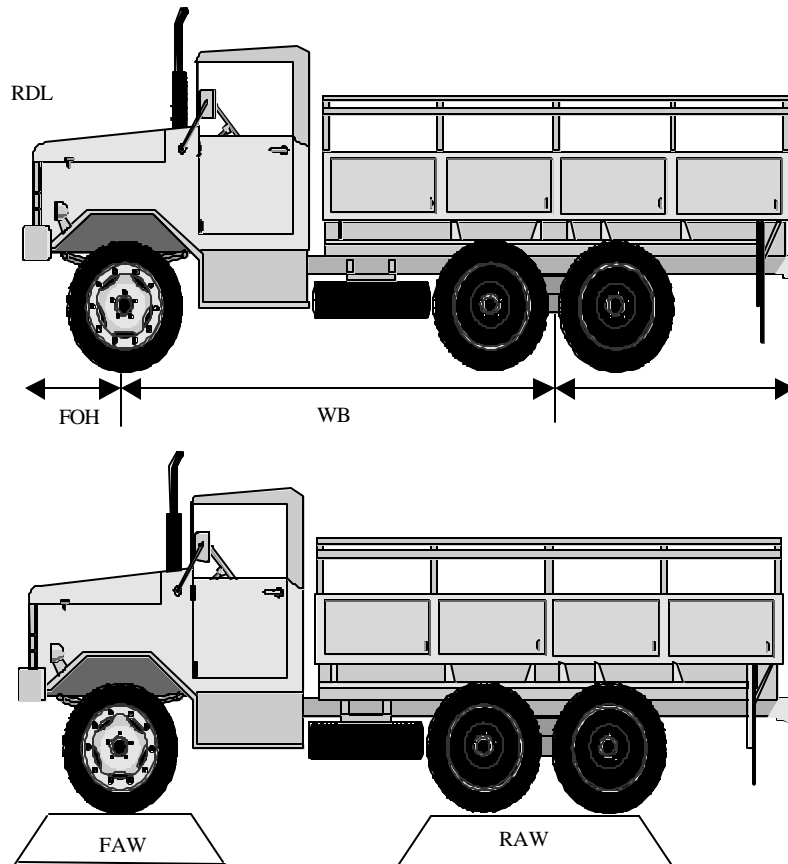
B. Method. To correctly load plan an airlift and segregate loads for individual aircraft, the correct weight and CB of cargo units must be determined. There are two main divisions-- vehicles and general cargo.

1. Determine weight and CB of a vehicle after all secondary cargo is secured for airlift. Secondary loads are items of baggage or cargo transported in truck beds and trailers, and must be included in the total weight of the vehicle. Adding to or removing cargo from a weighed and marked vehicle will necessitate reweighing and recomputing the CB.

2. The following terms are used to calculate CB of a vehicle:

- a. Reference Datum Line (RDL) (also called reference line). Predetermined point from which all measurements are taken. Normally, the RDL is established at the forward front edge.
- b. Front Overhang (FOH). Distance in inches from front bumper to center of front axle.
- c. Wheel Base (WB). Distance in inches from center of front axle to center of rear axle or center of tandem axles.
- d. Gross Weight (GWT) (pounds).
- e. Rear Overhang (ROH). Distance from rear or center of tandem axles to rear bumper.
- f. Front Axle Weight (FAW) (pounds).
- g. Intermediate Axle Weight (IAW) (pounds).
- h. Rear Axle Weight (RAW) (pounds).
- i. Front Forward Edge (FFE).

j. Moment. The product obtained by multiplying the weight by the distance (in inches) from the RDL.



**Figure O-1. Vehicle Measurement Points**

C. The computation formula illustrated on the following pages shows examples of different types of vehicles and possible loads. Prior to beginning the process, the unit movement officer must ensure the scales are calibrated.

1. Use the following formula to compute the CB location of vehicles. Multiply weight by distance of each axle from the reference line (in inches), then divide the total results by the vehicle gross weight. The resulting figure is the number of inches to be measured aft from the reference line to the CB of the vehicle.

Center of Balance Formula

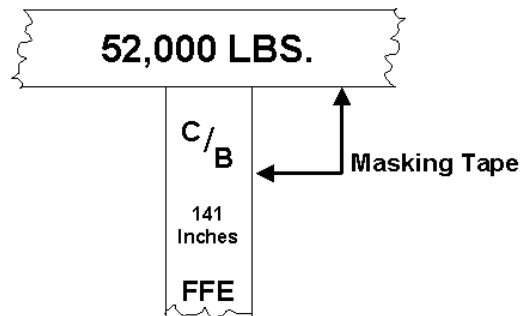
- W1 -- Front axle weight.
- W2 -- Rear axle weight.
- DI -- Distance from RDL to front axle or center of articulated tandem axle
- D2 -- Distance from RDL to rear axle or center of articulated tandem axle.

$$\frac{(W1 \times DI) + (W2 \times D2)}{\text{Gross Weight}} = \text{CB}$$

2. The vehicle CB is computed to the nearest whole inch. Any answer with a fraction of .5 or higher is increased to next higher number. If .4 or less, drop the number.

3. After computing the CB of a vehicle, mark its location and gross weight on both sides using weather resistant masking tape and grease pencil/magic marker, forming the letter “T”. (NOTE: Masking tape will not be used to mark CB location on aerospace ground equipment with permanently mounted CB markings IAW T.O. 35-1-3, Corrosion Prevention, Painting and Marking of USAF Support Equipment). The horizontal portion of the “T” will contain the gross weight information, and the vertical portion of the “T” will contain the letters “CB,” to indicate the exact position of the vehicle’s CB. Also indicate number of inches from the RDL of the CB location and mark axle weights above each axle. The RDL measurements will be taken from the FFE of the vehicle.

4. The following illustrations show examples of methods used to determine weight and CB location of typical cargo units. These cargo units include general cargo, large or skid-mounted cargo, track-type vehicles, and single-and multiple-axle vehicles.



**Figure O-2. Center of Balance Marker**

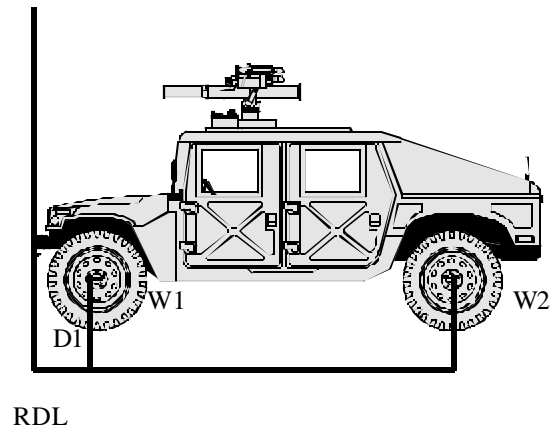
#### **EXAMPLE 1 – Determine CB of Vehicles.**

- Step 1. Weigh all axles individually.
- Step 2. Mark weight above each individual axle.
- Step 3. Establish the RDL (Reference Datum Line) at the forward edge of the vehicle.
- Step 4. Measure all distances from RDL to center of each individual axle.
- Step 5. Distance multiplied by weight equals a moment.

Example of basic formula for determining the CB.

$$\frac{(D1 \times W1) + (D2 \times W2)}{\text{GROSS WEIGHT}} = \text{CB from RDL}$$

## EXAMPLE ONE



D1 from RDL (from forward edge) to center of front axle = 20"

W1 front axle weight = 2,870 lbs

D2 from RDL (from forward edge) to center of rear axle = 150"

W2 rear axle weight = 2,550 lbs

$$\begin{array}{rcl}
 20" \times 2,870 & = & 57,400 \text{ moment} \\
 150" \times 2,550 & = & 382,500 \text{ moment} \\
 \hline
 & & 439,900 \text{ total moment}
 \end{array}$$

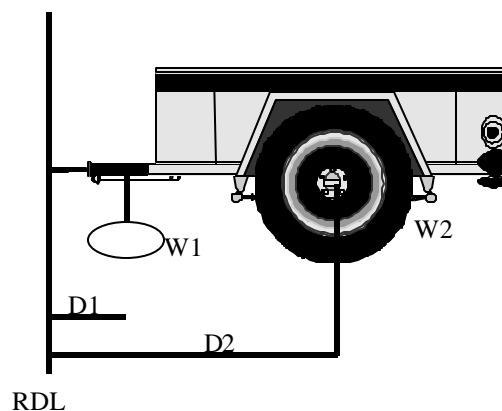
W1 (2,870 lbs) + W2 (2,550 lbs) = Gross Weight (5,420 lbs)

Total Moment (439,900) divided by Gross Weight = CB (81" from RDL)

$$[(D1 (20") \times W1 (2,870 \text{ lbs})) + (D2 (150") \times W2 (2,550 \text{ lbs}))]$$

Gross Weight (5,420 lbs) = CB (81" from RDL)

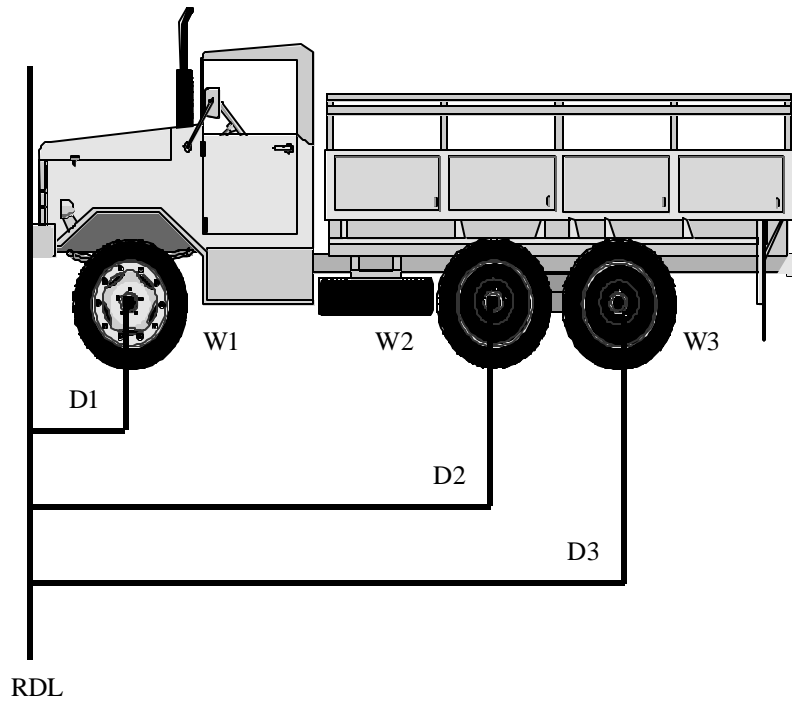
## EXAMPLE TWO



$$[D1 (15") \times W1 (250 \text{ lbs})] + [D2 (102") \times W2 (2,250 \text{ lbs})]$$

W1 (250 lbs) + W2 (2,250 lbs) = Gross Weight (2,500 lbs) = CB (93" from RDL)

### EXAMPLE THREE

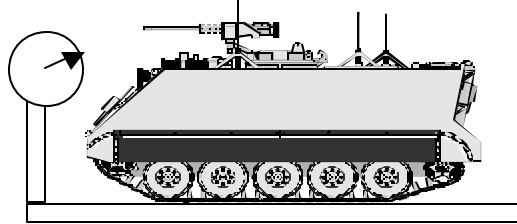


$$[D1 (70") \times W1 (12,500 \text{ lbs})] + [D2 (222") \times W2 (12,900 \text{ lbs})] + [D3 (276") \times W3 (12,700 \text{ lbs})]$$

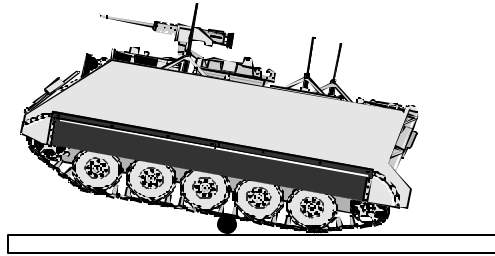
$$W1 (12,500 \text{ lbs}) + W2 (12,900 \text{ lbs}) + W3 (12,700 \text{ lbs}) = \text{Gross weight (38,100 lbs)} \quad = \text{CB (190" from RDL)}$$

**EXAMPLE 4** – Determine CB of Tracked Vehicles.

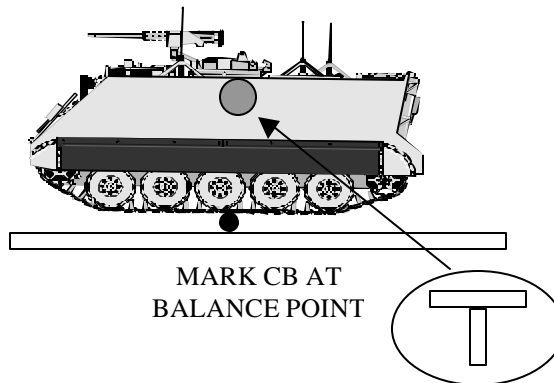
Step 1. To determine weight, drive the vehicle onto a platform scale (truck scale or coal yard scale) large enough to accommodate the entire vehicle. Record weight.



Step 2. To determine CB, drive the vehicle onto a wooden beam or pole until it tilts forward. Mark the side of the vehicle at the point of tilt.



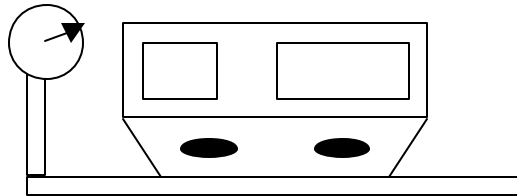
Step 3. Mark the CB and gross weight of the vehicle.



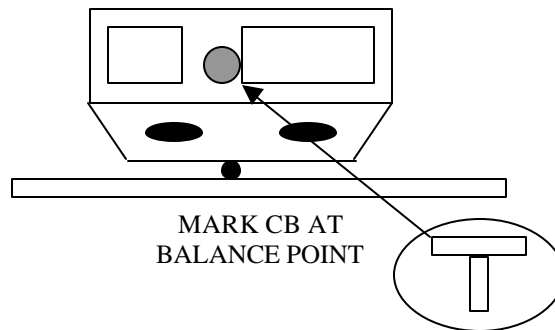


**EXAMPLE FIVE** – Determine CB of Skid-Mounted Cargo.

Step One. If the skid-mounted cargo will fit on the scale, weigh the whole load to use as weight figure.



Step Two. Determine the CB by placing the load onto a pipe and centering the cargo until it balances, then mark CB.



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## APPENDIX P

### STANDARD HAND SIGNALS FOR LOADING AND UNLOADING AIRCRAFT

DAY



NIGHT



*Straight Forward*



*Straight Backward*



*Slow Down*

**DAY**

**NIGHT**



*Turn Right*



*Turn Left*



*Stop*

DAY



NIGHT



*Turn Off Engine and Set Brake*



*Down*



*Up*



DAY



NIGHT



*Close Up - Stop*



*Change Direction*

*(Applicable to tracked vehicles only.)*

## **APPENDIX Q**

### **SEALIFT SOURCES**

Vessels identified herein comprise the dry cargo vessels of strategic sealift forces. Primary sources for these are government-owned or controlled and commercial vessels.

A. Government-owned or controlled vessels fall under control of Department of Transportation (DOT) or Department of Defense. The DOT Maritime Administration is responsible for maintenance of the Ready Reserve Force. The United States Transportation Command, through its sealift component command, Military Sealift Command, administers Large Medium Speed Roll-on/Roll-off Ships, Fast Sealift Ships and Afloat Pre-Positioning Force Ships in their common-user role. The Afloat Pre-Positioning Force Ships are available for common use after initial discharge and release by the theater commander.

B. Commercial Vessels. Commercial vessels make an important contribution in supporting large-scale deployments. Sources of commercial vessels for hire include United States and foreign-flag vessels. These vessels may be chartered by one of the following methods:

1. Time Charter. These vessels are chartered for specific periods of time regardless of the number of voyages.
2. Voyage Charter. These vessels are chartered for a specific number of voyages regardless of time involved.
3. Space Charter. The charter of space aboard a vessel trading in a regularly established liner or non-liner service between two points.

C. General Vessel Types.

1. Breakbulk. These vessels fall under the category of general cargo ships because of their ability to carry a variety of cargoes in various forms (i.e., bagged, boxed, palletized, refrigerated, and limited containerized cargoes). Configuration of a conventional breakbulk vessel is a weather deck with a series of cargo holds beneath. Cargo holds are divided by 'tween decks and accessed by a series of hatches. Cargo operations on a breakbulk vessel are generally lift on/lift off. Since the holds of a breakbulk vessel are serviced by ships' gear (booms, cranes, winches, etc.), these vessels are usually considered self-sustaining. Because of the self-sustainability of these vessels, they provide a valuable capability when operating in underdeveloped ports. Constraints encountered with these vessels are: slow speed, limited deck height and strengths, limited lifting capacity of ship's gear, extensive blocking and bracing and slow loading and unloading.

2. Container Ships. These vessels carry their entire load in intermodal containers (usually 20 to 40 feet in length). Full cellular stowage within holds allows containers to be secured without use of dunnage. Container ships are configured for stacked stowage of containers both in space below the main deck (frequently referred to as the weather deck) and on the main deck. Since most container ships are non-self-sustaining, due to lack of an installed crane system,

cargo operations require the use of shore-side cranes or auxiliary crane ships (T-ACS). These vessels can also transport flatracks, enabling them to carry a limited number of oversized, wheeled, and heavy tracked equipment items.

3. Roll-On/Roll-Off (RO/RO). These vessels are designed primarily as vehicle carriers. Cargo includes helicopters and wheeled, tracked, self-propelled, and towed vehicles. Large cargo capacities and rapid cargo loading and discharge rates characterize RO/RO vessels. Rapid movement of cargo is accomplished by a series of external and internal ramps. Cargo holds are typically large, open bays, where equipment may be driven, parked, and lashed down. Most RO/RO ships have external ramps that rest on the apron of the berth, allowing access to cargo holds. Most RO/RO vessels are usually considered self-sustaining.

4. Barge Carriers. These vessels transport barges in which cargo has been loaded and may be discharged midstream or harbor and pushed or towed to a berth. Barges are loaded or discharged at berths by shore-based cranes. When cargo operations are complete, barges are pushed or towed to the vessel, where they are brought aboard. Two types of barge carriers are lighter aboard ship (LASH) and sea barge (SEABEE). Both types are capable of discharging and recovering their barges into the water; however, the barges themselves are not self-sustaining. Side cranes and materials handling equipment are required to support these carriers.

5. Combination Vessels. These vessels employ a combination of cargo operation features in making up its configuration. A combination RO/RO and containership may have a stern ramp, RO/RO decks, and holds configured for stowage of containers.

6. Special Vessels. These are comprised of special mission and support vessels. Primary mission of the T-ACS is to off-load non-self-sustaining cargo vessels, i.e., containerships and cargo from barges from LASH or SEABEE vessels. In addition, they can carry limited amounts of cargo in flatracks below deck.

D. Procedures and guidance for loading, securing, and unloading equipment on the general vessel types are available in MTMCTEA Pamphlets 55-21, Lifting and Tie-Down of US Military Helicopters for Marine Transport; 55-22, Marine Lifting and Lashing Handbook; and 55-23, Containerization of Military Vehicles.



## APPENDIX R

### **HAZARDOUS MATERIALS (HAZMAT) EXCEPTIONS**

Information in this Appendix addresses waivers and exemptions to provisions of this Regulation, Part II, Cargo Movement, Chapter 204, in handling HAZMAT during unit deployments.

#### A. Exceptions.

1. Waivers. Department of Defense (DOD) Components having operational control of a specific location, operation, or exercise may waive DOD Component's regulations for the handling of ammunition, explosives, and other HAZMAT. They will ensure compliance with host nation (HN) regulations. DOD Components, to include theater Commanders in Chief (CINCs), cannot waive provisions of United States (US) 49 Code of Federal Regulations (CFR), or International Maritime Dangerous Goods Code (IMDGC). Requests for exemptions to these rules must be processed as indicated below.

#### 2. Exemptions.

a. Exemptions are issued by the Department of Transportation (DOT) on a case-by-case basis for deviations from 49 CFR (for Continental United States shipments only) (<https://eta.mtmc.army.mil/>). The shipper will submit the exemption request to their Service focal point, as listed in this Regulation, Part II, Cargo Movement, Chapter 204, Figure 204-4. Air Force Joint Manual (AFJMAN) 24-204, Defense Logistics Agency Instruction (DLAI) 4145.3, Marine Corps Order (MCO) P4030.19G, Naval Supply (NAVSUP) Publication (Pub) 505, Technical Manual (TM) 38-250, Preparing Hazardous Material for Military Air Shipments provides additional details. The shipper is responsible for providing exemption documentation to the mobility force. A copy of the exemption must accompany each shipment. The mobility force will accept non-compliant material for air transport only when accompanied by a DOT exemption. Exemptions to IMDGC will be granted by the International Maritime Organization.

b. The Military Traffic Management Command (MTMC), in coordination with the DOT, will act as the DOD proponent for exemption requests. Transportation Officers and Mobility Officers will submit requests through Service representatives to MTMC. MTMC will notify Service representatives and requester of results.

c. Exemption requests for 49 CFR and IMDGC will contain the following information:

(1) Provision(s) requiring exemption.

(2) Detailed description of proposal, including plans, drawings, calculations, procedures, test results, previous exemptions, approvals, or permits; a list of specifications or modified containers, if any, to be used; and any other supporting information.

(3) Hazard identification must include proper shipping name, hazard classification, packaging description, quantity, chemical name and characteristics of the material, and other pertinent information.

(4) Describe all relevant shipping and accident experience.

(5) Specify the proposed mode(s) of transportation, identifying any increased risks likely to result if the exemption is granted.

(6) Justification for the exemption, to include:

(a) Why existing regulations are not appropriate.

(b) How public or DOD interests are served.

(c) How exemption affects safety concerns.

d. Submit requests for extensions or renewals of an exemption through Service representatives to MTMC, Attn: MTOP-OPF.

(1) Routine requests must be submitted 120 days prior to the need for the exemption.

(2) Applicant seeking to have the request processed on a priority basis (less than 120 days) must provide additional justification to support raising the priority.

e. DOT exemptions are available for mobility exercises and actual operations. Shippers can request additional exemptions or assistance on use of existing exemptions through their Service representatives. Current exemptions are available on the MTMC web page at <https://eta.mtmc.army.mil/> or the DOT web page at <http://hazmat.dot.gov/exsys.htm>.

### 3. Mobility Considerations for Ammunition Shipments through Non-Ammunition Water Ports.

a. Ammunition and explosives are normally routed through authorized ammunition ports. During mobility operations, these shipments may be processed through non-ammunition ports, either military or civilian. Port commanders coordinate ammunition shipments through military and commercial ports within their area of responsibility. Each non-ammunition port has unique restrictions for processing ammunition and explosive shipments through their facility. Shippers must contact the port commander to obtain information required by a specific port. Shippers will provide required information to the port commander, and will ensure the port commander has issued port operations approval prior to release of ammunition and explosives from origin. Coordination must also be made between theater CINC and HN port authority when using other than designated HN ports.

b. Shippers are responsible for obtaining all required exemptions.

c. Port commanders are responsible for coordinating arrival of ammunition and explosive shipments at non-ammunition ports. Port commands will obtain all required waivers. Such waivers may grant permission to exceed Net Explosive Weight restrictions, alter temporary storage provisions, or conduct unusual loading operations.

d. Shippers and port command must ensure Military Sealift Command local representatives:

(1) Receive all pertinent shipment information prior to obtaining US Coast Guard permits.

(2) Receive all pertinent shipment information to obtain HN permits.

4. Use of Contracted Commercial Aircraft to Transport Explosives and Other Hazardous Materials. During a declared National Emergency or defense crisis condition requiring activation of the Civil Reserve Air Fleet (CRAF) to rapidly deploy US Armed Forces for national security purposes, the following requirements apply:

a. Aircraft must be operated by a CRAF carrier or a foreign-flag aircraft made available pursuant to formal security agreements between the US and the involved foreign government.

b. An individual knowledgeable of the items or material being transported will accompany shipments aboard aircraft operated by carriers not approved by Headquarters (HQ) Air Mobility Command (AMC) under DOT-E 7573 or when the carrier is not part of the CRAF program.

c. HQ AMC will obtain permission from the owner or operator of any civil airport used for loading, unloading or transit operations.

d. Type and quantity of material, packaging, preparation, loading, certification and any restrictions will be according to AFJMAN 24- 204/TM 38-250/MCO P4030.19G/NAVSUP Pub 505/DLAI 4145.3.

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